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Artículo Original

ECOLOGICAL IMPLICATIONS OF THE DIETARY HABITS OF THE WILD BOAR IN TEMPERATE SUBANTARCTIC FORESTS: A NEW PERSPECTIVE

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ABSTRACT. The wild boar, an exotic species in South American temperate forests, has shown an expanding distribution; however, their diet remains largely elusive. This study aimed to fill this gap by examining the diet of wild boars in new locations and seasons in Chile. We analyzed the contents of 35 wild boar stomachs, identifying and quantifying the occurrence of animal, plant, and fungi items. Our results revealed a diverse diet, with plant species representing 54.5% of the diet, fungi 7%, and animals 38.1%. The most consumed species were *Gunnera tinctoria* (45.7%), *Hylamorpha elegans* (25.7%), and *Gevuina avellana* (17.1%). Interestingly, we found that the consumption of fungal species occurred primarily in winter and spring. Conversely, wild boars were observed to consume vegetables predominantly during winter and autumn, shifting to a higher percentage of animal species in spring and summer. We found that 89.9% of the diet of the wild boar consisted of native elements, suggesting an extensive use of food resources within the temperate rainforest. Alarmingly, our study also identified the consumption of endangered species, *Chiasognathus grantii*, *Acanthinodera cumminguii*. The predation of the endangered *Dromiciops gliroides* and the *Eupsophus roseus* is not conclusive. Our study provides new insights into the dietary habits of the wild boar in Chile and highlights its extensive use of native food resources, including several endangered species, and underscores the potential ecological impact of the expanding distribution of the wild boar, suggesting a significant threat to the conservation of these species. Further research is needed to fully understand the ecological implications of these findings and to develop effective management strategies.

RESUMEN. IMPLICANCIAS ECOLÓGICAS DE LOS HÁBITOS DIETARIOS DEL JABALÍ EN BOSQUES TEMPLADOS SUBANTÁRTICOS: UNA NUEVA PERSPECTIVA. El jabalí, especie exótica expande su distribución en los bosques templados de América del Sur; sin embargo, su dieta sigue siendo en gran medida desconocida. El presente estudio tuvo como objetivo llenar este vacío, examinando la dieta de jabalíes en nuevas ubicaciones y temporadas en Chile. Analizamos el contenido de 35 estómagos de jabalí, e identificamos y cuantificamos la presencia de elementos animales, vegetales y fúngicos. Nuestros resultados revelaron una dieta diversa, con especies vegetales que representan el 54,5% de esta, hongos el 7% y animales el 38,1%. Las especies más consumidas fueron *Gunnera tinctoria* (45,7%), *Hylamorpha elegans* (25,7%) y *Gevuina avellana* (17,1%). Curiosamente, encontramos que el consumo de hongos se produjo principalmente en invierno y primavera. Por el contrario, se observó que los jabalíes consumían vegetales predominantemente durante el invierno y el otoño, pasando a un mayor porcentaje de especies animales en primavera y verano. Encontramos que el 89,9% de la dieta del jabalí consistía en elementos nativos, lo que sugiere un uso extensivo de los recursos alimentarios dentro del bosque lluvioso templado. De manera preocupante, nuestro estudio también identificó el consumo de especies en peligro de extinción, como *Chiasognathus grantii*, *Acanthinodera cumminguii*. La depredación sobre *Dromiciops gliroides* y *Eupsophus roseus* no es concluyente. Nuestro estudio destaca el uso

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extensivo de recursos alimentarios nativos, incluidas varias especies en peligro de extinción, lo que sugiere una amenaza significativa para la conservación de estas especies. Se necesitan más investigaciones para comprender completamente las implicaciones ecológicas de estos hallazgos y desarrollar estrategias de gestión efectivas.

Key words: *Sus scrofa*, diet, *Eupsophus roseus*, native, rainforest.

Palabras clave: *Sus scrofa*, dieta, *Eupsophus roseus*, nativo, bosque lluvioso.

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INTRODUCTION

The wild boar (*Sus scrofa*) is a species recognized for its adaptability, thriving in a range of environments from arid areas to wetlands, high mountains, marshes, and forests (Dardaillon 1987; LaSala et al. 2023). This adaptability has enabled the species to successfully colonize a variety of habitats worldwide (Ballari & Barrios-García 2014; Rosell et al. 2001). The wild boar is not native to Chile but is considered an exotic species that has established its presence in the country since the 1950s (Skewes & Jaksic 2015). The wild boar has been identified as one of the most damaging species to terrestrial biodiversity (Lowe et al. 2000; Risch et al. 2021). The growing distribution and population density of the wild boar have raised concerns about the adverse environmental effects it may have, particularly in its native areas (Barasona et al. 2021; Herrero et al. 2004; Schley & Roper 2003). The South American temperate forests, located between 35° and 55° south latitude, are recognized as one of the Global Biodiversity Hotspots (Myers et al. 2000). These forests are of significant ecological importance due to their provision of ecosystem services (Mori et al. 2017), yet they have experienced a long history of anthropogenic disturbances such as logging and fires (Caviedes & Ibarra 2017). These disturbances include not only human activities but also the impact of cattle and wild exotic mammals, such as the wild boar (Ballari et al. 2020). The potential impact of the wild boar on the environment is often inferred by analyzing their diet from stomach contents (Herrero et al. 2006; Ballari et al. 2014). Previous studies have found differences in the diet of the wild boar, with consumption of animal matter and fungi being greater in South America than in Europe (Ballari & Barrios-García 2014; Ballari et al. 2015). However, the knowledge of the wild boar diet in the endemic *Nothofagus* forests of South America is limited, relying on few studies (Cuevas et al. 2010; Ballari et al. 2014); they haven't analyzed *Nothofagus* forests, nor Ballari et al. (2015) nor van Hees et al. (2022). Previous research on the diet of the wild boar in Chile has been restricted to two sites described by Skewes et al. (2007) and the Puyehue National Park, as studied by Hernández et al. (2017). Given this backdrop, the current study aimed to improve the understanding of the diet and potential effects of the wild boar in the South Andean temperate forests. By investigating the diet of the wild boar in this specific region, the study sought to contribute new knowledge to the field and provide insights that could inform strategies for managing the wild boar population and minimize their impacts. The findings of this research could have significant implications for the conservation of biodiversity in the South Andean temperate forests and other similar ecosystems where the wild boar is present.

MATERIALS AND METHODS

We collected stomach content samples from wild boars hunted in accordance with regulations from 11 distinct localities (**Table** 1). Samples were obtained from 17 juvenile and 15 adult animals according to tooth eruption (Matschke et al. 1967). Of these, 17 corresponded to males and 15 to females. Meanwhile, 16 samples were collected in winter, seven in spring, five in summer, and four in autumn. The selected localities fall under two ecoregions, the Mediterranean Humid and the Mediterranean Perhumid, as classified by Hajek & DiCastri (1975). The chosen localities feature vegetation that aligns with the forest types described by Donoso-Zegers (1981), specifically oak-raulí-coihue (*Nothofagus obliqua - Nothofagus alpina - Nothofagus dombeyi*) and coihue-raulí-tepa (*Nothofagus dombeyi - Nothofagus alpina - Laurelia philippiana*). The annual rainfall in these areas ranges from 1200 to 2000 mm.

The methodology involved the collection of 32 samples, each comprising a mixture of stomach content up to 500 mL. The samples were preserved using an AFA solution, a mixture of 90% 70° alcohol, 5% formalin, and 5% acetic acid, following the protocol suggested by Skewes et al. (2007). This solution was chosen for its proven efficacy in preserving biological samples, for example, for subsequent analysis.

Table 1

Prospected localities, number of samples by locality, geographical coordinates, forest type present in the locality (Donoso-Zegers 1981), and presence or absence of previous sampling in Skewes et al. (2007).

Locality and number of samples	Geographical coordinates lat - long	Forest type	Previous sample*
Curacautín (3)	38° 25'S, 71° 53'O	Roble-Raulí-Coihue	No
Cunco (6)	38° 55' S, 72°01' O	Roble-Raulí-Coihue	No
Catrico (2)	39° 15' S, 72° 31'O	Roble-Raulí-Coihue	No
Lican Ray (3)	39° 29' S, 72° 09' O	Roble-Raulí-Coihue	No
Coñaripe (4)	39° 38' S, 72° 02' O	Coihue-Raulí-Tepa	No
Pellaifa (1)	39° 40' S, 71° 56' O	Coihue-Raulí-Tepa	No
Riñihue (1)	39° 48' S, 72° 23' O	Coihue-Raulí-Tepa	No
Liquiñe (2)	39°45' S,71°51' O	Coihue-Raulí-Tepa	No
Chanchan (3)	39° 51' S, 71° 58' O	Coihue-Raulí-Tepa	Yes
Choshuenco (3)	39° 49' S, 71° 55' O	Coihue-Raulí-Tepa	Yes
Trafún (1)	39° 56' S, 72° 36' O	Roble-Raulí-Coihue	No
Llifén (1)	40° 12' S, 72° 15' O	Roble-Raulí-Coihue	No
Volcán Carrán (2)	40° 35' S, 72° 07' O	Coihue-Raulí-Tepa	No

*Previous sample refers to the existence of specific data on European boars diet in Skewes et al. (2007).

The samples were then processed and analyzed in accordance with the methods outlined by Skewes et al. (2007). In short, it consisted of washing the material with running water on a 1000 μm mesh. The material on the mesh was spread on a white plastic tray to which sufficient water was added to cover the material. This involved a comprehensive examination of the stomach content. First, a macroscopic inspection was performed with the naked eye to identify large items and then examined with a 4.6 and 12x stereoscopic magnifying glass. Then contents were washed with water on a 1.0 mm mesh to eliminate gastric juices and unidentifiable particles Wood & Brenneman (1980). The items were meticulously sorted and identified. The taxonomic status of the items was determined based on several references: Marticorena & Quezada (1985) for plants, Tamayo & Frassinetti (1980) for mammals, Peña (2006) for invertebrates, and Furci (2007) for fungi. In certain cases, we consulted specimens from the herbarium and the zoology museum as well as specialists from the Faculty of Natural and Oceanographic Sciences of the University of Concepción to ensure accurate identification.

The results of our analysis are expressed through several trophic indicators, including the frequency of occurrence, the percentage of occurrences, representativeness, and volumetric. The frequency of occurrence refers to the absolute number of stomachs in which a certain item is present. The representativeness corresponds to the percentage a certain group of items contributes to the overall diet. The percentage of occurrences expresses the number of stomachs in which a particular food item appeared.

To quantify the volumetric percentage of each food item greater than 1 mL, we employed the water displacement method as described by Moreno et al. (2006) and Skewes et al. (2007). This method involves measuring the displacement of water caused by the addition of a food item to a known volume of water. The difference in water level before and after the addition of the food item provides a measure of the volume of the item.

While our research does not involve any statistical methods, the rigorous data collection and analysis techniques employed ensure the validity and reliability of our findings. We provide results from seasons of the year that had not been previously sampled, such as spring and summer. Also, the area sampled covers two regions and nearly 22 000 km^2, much more than previous studies (**Table** 1). Our findings supply new information and have the potential to inform future research in this field.

RESULTS

The examination of 32 stomach contents produced 55 identifiable items (**Tables** 2 and 3), classified into three categories: plant origin (30 items), fungi (four species), and animal origin (21 items). Eight items were insufficiently identified and thus excluded from further analysis. This encompassed bark, wood, fungus, grass leaves, and grass, with an average occurrence percentage of 12.5% and a mean volumetric percentage of 2.8%. Among the identified items, *Gunnera tinctoria* (rhizome, petiole, and fruits) represented the most consumed, with a frequency of appearance of 16, an occurrence percentage of 45.7%, and a mean volumetric percentage of 22.3%. Following *G. tinctoria*, the larval stage of the animal species *Hylamorpha elegans* exhibited high trophic indices based on occurrence. Seasonal variations (**Table** 2) were evident in the diet of *Sus scrofa*, with a higher consumption of plant species in autumn and winter and a shift towards more animal items in spring and summer (**Tables** 4, 5, and 6). Certain items, such as *Gunnera tinctoria*, *Hylamorpha elegans* larvae, and *Nothofagus dombeyi*, leaves were consistently found in

Table 2

Plant and fungi species identified in the stomach content of wild boar, ordered according to percentage of occurrence. It also shows frequency of appearance, volumetric percentage, and origin (native or exotic).

Plant items	**Frequency of occurrence**	**% of occurrence**	**Average of volumetric % occurrence**	**Native species**	**Exotic species**
Gunnera tinctoria	16	45.7	22.3	x	
Gevuina avellana	6	17.1	39.6	x	
Ranunculus sp.	4	11.4	18	x	
Greigia sphacelata	3	8.6	26.6	x	
Persea lingue	3	8.6	11.3	x	
Nothofagus dombeyi	2	5.7	8	x	
Avena sativa	2	5.7	59.5		x
Juncus sp.	2	5.7	20	x	
Quercus sp.	2	5.7	74		x
Vicia sp.	2	5.7	6		x
Amomyrtus meli	1	2.9	8	x	
Briofita	1	2.9	4	x	
Bromeliaceae	1	2.9	44	x	
Carex sp.	1	2.9	36	x	
Chusquea sp.	1	2.9	12	x	
Cyperus sp.	1	2.9	40	x	
Escalonia rubra	1	2.9	4	x	
Myrtacea	1	2.9	4	x	
Pyrus communis	1	2.9	16		x
Pyrus malus	1	2.9	28		x
Saxegothaea conspicua	1	2.9	76	x	
Trifolium sp.	1	2.9	72		x
Fungi items	**Frequency of occurrence**	**% of occurrence**	**Average of volumetric % occurrence**	**Native species**	**Exotic species**
Cyttaria sp.	2	5.7	62	x	
Ganoderma applanatum	1	2.9	40	x	
Unidentified fungi	1	2.9	11	x	
Morchella sp.	1	2.9	28	x	

stomach contents across all seasons. However, *H. elegans* larvae were detected in larger quantities (30-60 units) during winter and spring. Other species demonstrated seasonal consumption patterns. For instance, seeds of *Gevuina avellana* were primarily found in samples collected in autumn. Fungal species also displayed seasonal variation. *Cyttaria* sp. and *Gannoderma applanatum* were detected in spring, while *Morchella* sp. was found in winter samples. In terms of origin, native species constituted 89.5% of the species found, while introduced species accounted for the remaining 10.4%. All animal-origin species were native. Among the native species, 42.5% (20 species) were endemic to the subantarctic *Nothofagus* forest. Seven of these endemic species, including *Acanthinodera cummingii*, *Amomyrtus meli*, *Ceroglossus barcoti*, *Dromiciops gliroides*, *Eupsophus roseus*, *Morchella* sp., and *Gregia sphacelata*, are solely found in Chile. The remaining 14 species are endemic to the temperate forests of Chile and Argentina (**Table** 7). This comprehensive analysis elucidates the diverse diet of *Sus scrofa*, with a clear preference for native and endemic species. It also highlights the importance of certain species like *Gunnera tinctoria* and *Hylamorpha elegans* larvae in the diet, as well as the seasonal consumption of other species. The findings provide a deeper understanding of the feeding habits of *Sus scrofa*, which can contribute to the management and conservation strategies for this species and its habitat.

Table 3

Animal species identified in the stomach contents of wild boars analyzed, ordered by class and percentage of occurrence. It also shows frequency of appearance, volumetric percentage, and origin (native or exotic).

Animal species	Frequency of occurrence	% of occurrence	Average volumetric % occurrence
Insecta			
Hylamorpha elegans (larvae)	9	25.7	32.2
Scarabeidae (larvae)	9	25.7	23.6
Lepidopthera (larvae)	5	14.3	4.6
Chiasognathus grantii (larvae)	4	11.4	27.5
Tipulidae (larvae)	3	8.6	2.3
Ceroglossus buqueti	2	5.7	26
Ceroglossus sp.	2	5.7	4
Lucanidae (larvae)	2	5.7	18
Grillidae	2	5.7	28
Muscoidea (larvae)	1	2.9	6
Tabanidae (larvae)	1	2.9	12
Lepidopthera: Lasiocampidae (larvae)	1	2.9	8
Lepidopthera: Noctuidae (larvae)	1	2.9	4
Lepidopthera: Artiidae (larvae)	1	2.9	10
Acanthinodera cummingui (larvae)	1	2.9	2
Scolopendra sp.	1	2.9	8
Aves			
Pteroptochos tarnii	2	5.7	28
Scelorchilus rubecula	1	2.9	16
Mammalia *Abrotrix olivaceus*	1	2.9	8
Dromiciops gliroides	1	2.9	8
Amphibia			
Eupsophus roseus	1	2.9	4

DISCUSSION

Our analysis of the wild boar diet in the South Andean temperate forests reveals a previously undocumented high percentage (89.5%) of native items, underscoring the wild boar's extensive utilization of the trophic opportunities within these forests. This is the first time that such an extensive consumption of native items by wild boars in this region has been documented, providing new insights into their feeding habits. *Gunnera*, a plant native to the region, presented the highest percentage of occurrences (45.7%) and a substantial volumetric percentage (22.3%). This plant is consumed throughout the year with emphasis on autumn and winter, which aligns with Skewes et al. (2007) findings, albeit they reported a higher value based on a smaller sample size and mainly from winter. The consistency of these findings reinforces the importance of *Gunnera* in the diet of the wild boar during winter. The *Gevuina avellana*, endemic to Chile and Argentina, is the second plant species with the highest occurrence percentage (17.1%) after *Gunnera*. Despite being consumed less frequently than *Gunnera*, its consumption becomes abundant when *Gevuina* nuts are available in autumn and winter. This is consistent with (Murúa & Gonzalez 1985), who highlighted *G. avellana* nut's high caloric intake among native tree seeds, suggesting a preference by the wild boar for these seeds.

A novel aspect of this research was the identification of forage species, such as *Avena sativa* (59.5%) and *Trifolium* sp. (72%), in the wild boar diet in Chile. This item reflects the expansion of the wild boar's distribution in Chile, reaching agricultural areas of the intermediate depression (Skewes & Jaksic 2015). This finding may explain the growing conflicts with agriculture (Cerda et al. 2017) and the increase in the wild boar's reproductive rate when abundant energy foods (crops) are accessible (Drimaj et al. 2020). Despite the novelty of this finding, these results may be limited by the reliance on stomach content analysis, which only provides information on the diet of the wild boar at the time of

Table 4

Presence of plant items by season of the year, indicated by a cross, present in the stomach content of European wild boars.

Plant species	**A**	**W**	**SP**	**SU**
A. meli	+			
Avena sativa			+	+
Briofita		+		
Bromeliaceae		+		
Carex sp.		+		
Chusquea sp.	+			
Cyperus sp.		+		
E. rubra		+		
G. avellana	++++	+	+	
Gregia sphacelata	+	++		
Vicia sp.	+	+		
Juncus sp.			++	
Myrtacea				+
N. dombeyi	+	+	+	+
P. lingue		+	+	
P. communis	+			
P. malus	+			
Quercus sp.	+	+		
Ranunculus sp.	+	+		++
S. conspicua				+
Trifolium sp.		+		
G. tinctoria	+++	+++++	++	+
Total items consumed per season	16	19	8	7
% items consumed per season	32	38	16	14

A: autumn; W: winter; SP: spring; SU: summer.

Table 5

Presence of fungi items by season of the year, indicated by a cross, present in the stomach content of European wild boars.

Fungi species	**A**	**W**	**SP**	**SU**
Cyttaria sp.			++	
G. applanatum			+	
Morchella sp.		+		
Unidentified fungi		+		
Total items consumed per season	0	2	3	0
% items consumed per season	0	40	60	0

A: autumn; W: winter; SP: spring; SU: summer.

Table 6

Presence of animal items by season of the year, indicated by a cross, present in the stomach content of European wild boars.

Animal species	A	W	SP	SU
A. olivaceus	+		+	
A. cumminguii (larvae)			+	
Ceroglossus sp.			+	+
C. buqueti				++
C. grantii (larvas)	+	++	+	
D. gliroides			+	
Eupsophus roseus		+		
Grillidae		+		
H. elegans (larvae)	+	+++	+++	+
Lepidopthera (larvae)	+	++		++
Lepidopthera: Lasiocampidae (larvae)	+			
Lepidopthera: Noctuidae (larvae)				+
Lucanidae (larvae)			+	+
Muscoidea (larvae)			+	
P. tarnii	++			
Lepidopthera: Artiidae (larvae)			+	
Scarabeidae (larvae)	+		++++++	++
Scolopendra sp.		+		
Tabanidae	+			
Tipulidae (larvae)	+	+		+
S. rubecula			+	
Total items consumed per season	10	10	18	11
% ítems consumed per season	20.4	20.4	36.7	22.4

A: autumn; W: winter; SP: spring; SU: summer.

sampling. Additionally, the sample size could potentially limit the generalizability of the findings.

A significant portion (76.1%) of the animal species in the wild boar diet belongs to the Insecta class, with *Hylamorpha elegans* presenting the highest percentage of occurrences (25.7%) and a high volumetric percentage (32.2%). Adults and larvae of *Chiasoghnathus grantii* (stag beetle) were in 11.4% as a percentage occurrence. Skewes et al. (2007) report 12.5% to 66.7% depending on locality, and Hernández et al. (2017) report 57% as a percentage occurrence. This beetle, endemic to Chile and Argentina, is of conservation concern (Vergara & Jerez 2009). It has a biological cycle of up to three years with its larvae living in galleries 20-40 cm deep, where they feed on roots and organic debris (Briones et al. 2012). The relatively high rate of consumption and biological features of this insect support a potential negative effect on its population, which is consistent with Harvey et al. (2011), who identified the wild boar as the major predator of the larvae of a similar lucanidae, the *Lucanus cervus*, in Europe. Our study also provides the first evidence of the presence of the amphibian *Eupsophus roseus* in the stomach of one wild boar. Nevertheless, this finding does not allow us to conclude that it has been preyed on, as it may be carrion. This amphibian, which lives exclusively in temperate rainforests in Chile, is listed as Vulnerable by CONAMA's Species Classification Regulation. The loss of habitat due to the replacement of the native forest is a major threat to this species (Rabanal Gatica & Nuñez Navarro 2008). Given the ability of the wild boar to root and the microhabitat of the amphibian, the risk of predation is high. This finding calls for further studies on the declines of amphibian populations in areas with the presence of wild boars.

Just like *Eupsophus roseus, Scelorchilus rubecula* lives associated with the humus layer of temperate rainforests (González & Martínez 2004; Rabanal Gatica & Nuñez Navarro 2008). Rhinocryptids were previously documented in the diet of the wild boar (Skewes et al. 2007); then, we assume that *S. scrofa* includes them in its diet.

The potential of the influence of the wild boar on the dispersion of native seeds and spores and the role of mycelia in nutrient redistribution within forests is not yet clear (Ballari et al. 2024; Cuevas et al. 2021). Ballari & Barrios-García (2014) touch on the consumption of mushrooms by wild boar being greater in its introduced range than in its native range, and Soteras et al. (2017) suggest that this species may influence the distribution of both native and exotic fungal species within a radius of up to 2.5 km. This

Table 7

Native, endemic, and introduced species detected in the stomach contents of *Sus scrofa*. At the bottom of the table, the percentage of representativeness for each of these categories is shown.

Native species	**Endemic species**	**Exotic species**
Abrothrix olivaceus	*Acanthinodera cummingi*	*Avena sativa*
Acanthinodera cummingi	*Amomyrtus meli*	*Quercus* sp.
Amomyrtus meli	*Ceroglossus buqueti*	*Pyrus communis*
Briofita	*Dromiciops gliroides*	*Pyrus malus*
Bromeliaceae	*Morchella sp.*	*Trifolium* sp.
Carex sp.	*Ochagavia carnea*	*Vicia* sp.
Ceroglossus sp.	*Eupsophus roseus*	
Ceroglossus buqueti	*Abrothrix olivaceus* (*)	
Chiasognathus granti	*Ceroglossus* sp. (*)	
Chusquea sp.	*Chiasognathus granti* (*)	
Cyperus sp.	*Cyttaria* sp. (*)	
Cyttaria sp.	*Escallonia rubra* (*)	
Eupsophus sp.	*Gevuina avellana* (*)	
Escallonia rubra	*Gunnera tinctoria* (*)	
Ganoderma applanatum	*Hylamorpha elegans* (*)	
Gevuina avellana	*Nothofagus dombeyi* (*)	
Gregia sphacelata	*Persea lingue* (*)	
Grillidae	*Pteroptochos tarnii* (*)	
Gunnera tinctoria	*Saxegothaea conspicua* (*)	
Hylamorpha elegans	*Scelorchilus rubecula* (*)	
Juncus sp.		
Lepidopthera: Artiidae		
Lepidoptera: Lasiocampidae		
Lepidoptera: Noctuidae		
Lucanidae (larvae)		
Morchella sp.		
Myrtacea		
Muscoidea (larvae)		
Nothofagus dombeyi		
Persea lingue		
Pteroptochos tarnii		
Ranunculus sp.		
Saxegothaea conspicua		
Scarabeidae (larvae)		
Tabanidae (larvae)		
Tipulidae (larvae)		
Scolopendra sp.		
89.5 % representativeness	42.5 % representativeness	10.9 representativeness

(*) Endemic species to Chile and Argentina.

could significantly impact the composition and structure of various ecosystems, altering fundamental ecological dynamics and potentially modifying species interactions within the affected habitat. Regarding seed dispersal, it has been reported that *Sus scrofa* has a significant negative impact on the establishment of endemic species such as *Araucaria araucana* seeds. Wild boars consume between 10% and 30% of the available seeds in Chile (Sanguinetti & Kitzberger 2010), and this predation reduces the survival of seeds and consequently hinders seedling establishment. Furthermore, wild boars can disturb the habitat of native species of plants and fungi by rooting, which directly impacts seed survival and the associated animal communities that contribute to seed dispersal (Ballari et al. 2024; Sanguinetti et al. 2023). This adds another dimension to the ecological impact of the feeding habits of the wild boar and calls for further research in this area.

CONCLUSIONS

In South Central Chile, our study demonstrates that the wild boar exhibits a dietary preference for native species (89.5%) over exotic species (10.4%). The most frequently consumed species include *Gunnera tinctoria* (45.7%), *Hylamorpha elegans* (25.7%), *Gevuina avellana* (17.1%), *Chiasognathus grantii* (11.4%), and *Ranunculus* sp. (11.4%). This study provides the first comprehensive assessment of the seasonal dietary patterns of wild boars, revealing a higher consumption of plant species during autumn and winter and animal species during spring and summer. Moreover, we found that mushrooms are primarily consumed in winter and spring. The importance of these findings lies in their implications for understanding the ecological role and impact of wild boars in South Central Chile. Notably, our results reveal that wild boars consume species with conservation concerns, such as *Chiasognathus grantii*, *Acanthinodera cummnigui*. *Dromiciops gliroides*, and *Eupsophus roseus* were each found in a single sample. This does not allow us to conclude that they have been preyed upon, as they may be carrion instead.

Each one appears in a single sample, warning of its probable predation. This consumption can potentially accelerate processes of decline and extinction of these species, underscoring the potential impact of the wild boar on local biodiversity and ecosystem dynamics. These findings provide important insights into the dietary habits of wild boars and their potential ecological impacts, contributing to a more nuanced understanding of the complex interactions between invasive species and native ecosystems. This knowledge is particularly relevant for the development of effective conservation strategies and management policies aimed at preserving local biodiversity and ecosystem health. Looking forward, further research is needed to better understand the ecological consequences of the dietary habits of the wild boar. Specifically, future studies should examine the population dynamics of the species consumed by wild boars, particularly those with conservation problems. This would provide a more detailed understanding of the potential impacts of wild boar predation on local biodiversity. Furthermore, additional research should explore the potential impacts of seasonal shifts in the diet of the wild boar on ecosystem dynamics. For instance, the implications of the preference of the wild boar for plant species during autumn and winter and animal species during spring and summer remain to be fully understood. Understanding these seasonal dietary shifts could provide valuable insights into the role of the wild boar in nutrient cycling and energy flow within ecosystems. In conclusion, our study provides a comprehensive overview of the diet of the wild boar in South Central Chile, revealing a preference for native species and a potential impact on species with conservation problems. These findings underscore the importance of understanding the dietary habits of invasive species for biodiversity conservation and ecosystem management. Further research is needed to fully elucidate the ecological implications of these findings and to inform effective conservation strategies.

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